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ABSTRACT

This study examined the use of interactive videodisc technology in a physical education methods course. It was designed to: (1) evaluate the use of interactive videodisc technology by physical education majors; (2) describe the amounts and type of control utilized by learners using interactive videodisc technology in a controlled learning situation; (3) evaluate potential problems of the use of interactive videodisc technology with novice users; and (4) describe student attitudes toward the use of interactive video. Subjects were enrolled in a physical education methods course, and were studying playground equipment and use of playground equipment with physically handicapped students. After a pretest on the instructional material, subjects viewed the interactive videodisc and, through controls incorporated in the HyperCard-based computer program, were able to stop to take notes and/or to review any of the video segments. At the conclusion of the videodisc segment, subjects were tested again and the results correlated with subject actions (stopping the disk, reviewing the material, and time on task) which occurred during the viewing of the instructional material. Subject actions were also correlated by gender. Results indicated that females stopped the videodisc and reviewed segments more often, and spent more time on task than males. Subjects' scores on the posttest reflected these differences. It is concluded that the level of user control is an area that must be addressed when developing interactive videodisc materials for instruction use. (DB)

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Use of Interactive Videodisc Technology in a Physical Education Methods Class

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The expanding role of computers in today's educational setting cannot be ignored. The ability to adapt instruction in order to make use of new technologies is fast becoming a necessity for educators. One method of instruction which utilizes these new technologies is the use of interactive videodisc instructional materials. Interactive videodisc technology combines the benefits of computer technology with videodisc technology. This combination of presentation systems allows the user to control information which can consist of still-frame or motion video, along with audio information, and on-screen computer information. The user can be directed to any designated path of information available, or can select the path which contains information to be studied. This user-controlled type of study combined with the wide choice of information available on videodisc make the use of interactive videodisc technology both educationally sound and potentially powerful.

This study reports on an examination of the use of interactive videodisc technology in a physical education methods course. This study was specifically designed to: (a) evaluate the use of interactive videodisc technology by physical education majors; (b) describe amounts and type of

control utilized by students using interactive videodisc technology in a controlled learning situation; (c) evaluate potential problems of the use of interactive videodisc technology with novice uses; and (d) describe student attitudes towards the use of interactive videodisc technology.

Perspective

Interactive videodisc has been shown to be both effective and efficient (Smith, 1987), meet learner's needs in ways never before possible (Gindele & Gindele, 1984), allow students to take and active role in their education (D'Ignazio, 1989; Bosco, 1989), save time for both students and faculty (Branch, Ledford, Robertson, & Robison, 1989). Bosco (1989) and others, however, have discussed the need for effective evaluation before, during, and after the use of interactive videodisc instruction. This need for effective evaluation was addressed in this study, however, due to both time constraints and small sample size, the conclusions reached should not be generalized into other areas.

In the area of physical education, very little has been written concerning the use of videodisc technology. Few videodiscs are available which are suitable for use in physical education methods classes. As this technology becomes more affordable and more physical educators begin to incorporate the technology into their classes, more videodisc-based materials should become available. Videodiscs can be mastered for under $500. However, the time and development of these materials must be taken into consideration when an educator desires to *develop* interactive

materials.[1] Kelly, Wakley, & Tarrant (1988) have utilized interactive videodisc technology to allow students to evaluate the motor skills of overhand throws, catch, kick, and horizontal jump in young children. They discuss the benefits of this technology, urging that "physical educators must become active in both using and developing these interactive videodisc applications". (p. 26) They also strongly feel that "interactive videodisc applications have great potential for developing skills where extensive teacher time and expertise are required to guide and provide learners with feedback." (p. 26) O'Sullivan, Stroot, Tannehill, & Chou (1989) have evaluated the use of interactive video in physical education and found that interactive video use in physical education has been infrequent but that interactive video would be a good medium with which to teach the skills of behavior analysis and for diagnosis of strengths and weaknesses of student performance.

Methods/Techniques

A HyperCard-based computer program which allowed for limited user control was created which utilized the *I'm Special* interactive videodisc (developed by Stephen Klesius, Louis Bowers and William Buxton from the University of South Florida). As the subjects for this class were enrolled in an adaptive physical education methods course, the section of the videodisc chosen to use for this study (Places to Play) demonstrates and discusses various aspects of playground equipment and use of playground equipment with physically handicapped students. Subjects were pretested with twenty

[1] Several excellent books have been written which address the costs, time, and instructional design considerations which should be evaluated when developing interactive videodisc materials. See, for example, *Learning with Interactive Multimedia*, edited by Sueann Ambron and Kristina Hooper, available from Apple Computer or *Advanced Interactive Video Design: New Techniques and Applications*, by Nicholas Iuppa with Karl Anderson, available from Knowledge Industry Publications, Inc.

questions based upon the material covered in the videodisc segment. Subjects were allowed to view the videodisc and, through controls incorporated into the computer program, were able to stop to take notes and/or to re-view any of the video segments. Limited user control was incorporated into the computer program in order to more easily assess the benefits of utilization of the videodisc program and to eliminate potential problems. During the viewing of the videodisc material, an observer was on hand to assist the subjects with utilization of the videodisc equipment and to monitor student actions (such as note taking). At the conclusion of the fifteen minute videodisc segment, the subjects were again tested and the results correlated with subject actions (stopping the videodisc, reviewing the material, and time spent on task) which occurred during the viewing of the instructional material.

Upon completion of the written post-test, subjects were given an attitudinal survey to determine reaction to both using the videodisc and the method of presentation. (See Appendix A for sample attitudinal survey questions.)

Data Source

19 pre-service physical education majors (10 male, 9 female) from a physical education methods course on adapted physical education were utilized for this study.

Results/Conclusion

The results of the actions taken by the subjects during the viewing of the videodisc were analyzed and compared with the scores on the test given at the conclusion of the viewing of the videodisc segment. Data was analyzed based on both gender and types of actions (stopping of videodisc, reviewing

of video segments) taken during the viewing of the videodisc. Gender was utilized in the data analysis based upon observation note of both the amount of time taken to view the videodisc material and the number of videodisc stops made by the female subjects. To this end: (a) females stopped the videodisc to take notes five times more often than did males; (b) females reviewed specific videodisc segments more than did males(1.22 times to 1); (c) females spent more time viewing the program than did males (13 minute videodisc segment - males spent an average of 15 minutes, 11 seconds; females spent an average of 18 minutes, 26 seconds); (d) females score higher on the post-test than did males (87.78 to 76); (e) the number of times the subject stopped the videodisc did affect the test score; and (f) the number of times the subject reviewed a videodisc segment did affect the test score.

All subjects obtained a positive score on the attitudinal survey which reflected that the information presented was important to them as educators and that the method by which the information was presented was both beneficial and helpful.

Table 1

Mean Performance on Various Measures, by Gender

Measure	Female (n = 9)	Male (n = 10)
Videodisc stops	5.00	1.00
Videodisc reviews	1.22	1.00
Score	87.50	76.00
Time on task (min.-sec.)	18' 26"	15' 11"

Discussion

The educational importance of this study is twofold in addressing the need of the student and in addressing the need for the development of interactive videodisc materials for use in physical education methods classes. Previous studies have shown that student achievement can be improved through the use of interactive videodisc instruction. The literature suggests that use of single-frame and stop-action videodisc can be of great benefit when studying motion or physical activities such as throwing or jumping. This study evaluated the use of videodisc technology in settings other than those involving physical activities and found a potential for use that has not yet been fully tapped. In addition, this study found that the ability to provide repeated demonstrations of physical education equipment can affect student acquisition of knowledge. The ability to address both visual and aural learners as well as to provide information which can be repeatedly reviewed can be beneficial to many learners. This ability to

provide scenarios of physical activities which can be repeatedly analyzed in both slow motion and regular speed should prove to be of importance in the physical education methods classroom. This study does provide information which should be utilized when developing interactive videodisc instructional materials for use in physical education classes. Very few problems with the subject use of the computer and videodisc equipment were noted during observation. Emphasis was placed on limited user control for this study. As shown, different students will make different choices on what to view, how many times to view, and when to view information when using this technology. In this study, the subject's acquisition of knowledge varied based upon the choices made. The level of user control is an area which must be addressed when developing interactive videodisc materials for physical education classes or other instructional uses. Finally, as was shown, subjects utilizing the interactive videodisc materials felt that they could potentially provide a beneficial method of providing information in a physical education setting. This use of technology must be further examined in this setting.

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APPENDIX A

Sample Attitudinal Questions Based Upon Use of Videodisc

- I would like to be able to watch certain parts of the video again.
- This information would be better presented in a book
- The video is not important for what I plan to teach.
- I learned a lot from the video.
- I didn't think the information in the video was important.
- I liked being able to stop whenever I needed to.